



# MORTALITY PROJECTIONS

Oct 1, 2010  
2011 Technical Panel  
Washington, DC

Alice Wade & Michael Morris  
Office of the Chief Actuary, Social Security Administration

# Mortality Projections



2

- Brief description of the method of projecting mortality
- Show results
- Address the questions of projecting mortality by cause of death

# Method of Projecting Mortality



3

- **Annual central death rates are the key variables used in the projections.**
  - ▣ Central death rates for the starting year
  - ▣ Annual rates of decline in the central death rates

# Method of Projecting Mortality: Rates of decline in central death rates



4

- Historical average annual declines in central death rates are calculated
  - ▣ Over the most recent 20 year period (1986-2006)
  - ▣ For 21 age groups, 2 sexes, and 7 causes of death
- Ultimate average annual declines in central death rates are adopted by the Trustees
  - ▣ Reached in the 24<sup>th</sup> year following the year of the Trustees Report (2034)
  - ▣ For 5 age groups, 2 sexes, and 7 causes of death.
- Formula is used to transition from the average annual declines over the historical period to the ultimate rates of decline

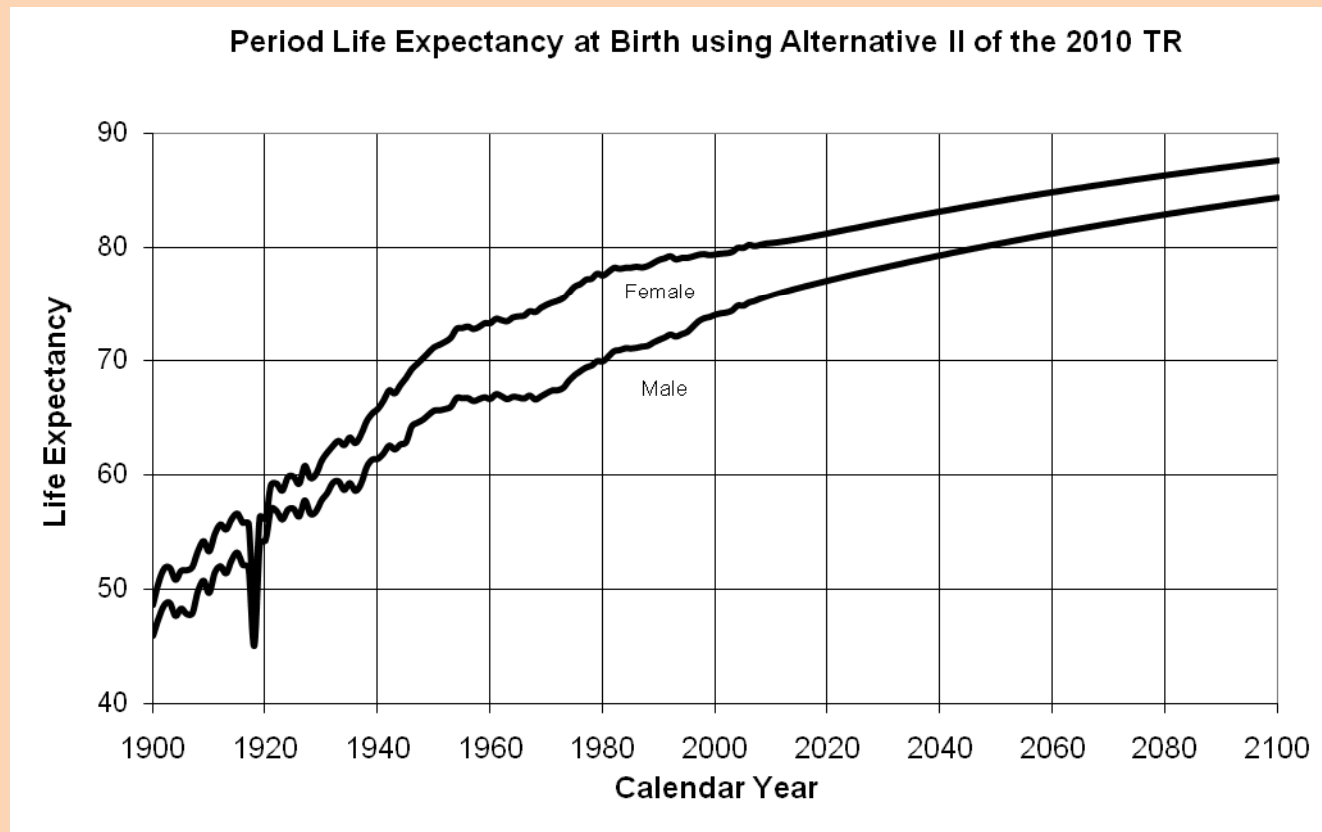
# Mortality Results: Average Annual Rate of Decline in Age-Adjusted Central Death Rates

	Males			Females		
	<u>Total</u>	<u>0-64</u>	<u>65+</u>	<u>Total</u>	<u>0-64</u>	<u>65+</u>
<i>1900- 1936</i>	0.72%	1.45%	0.20%	0.84%	1.64%	0.31%
<i>1936- 1954</i>	1.57%	2.30%	1.18%	2.37%	3.78%	1.77%
<i>1954- 1968</i>	-0.23%	0.03%	-0.35%	0.73%	0.74%	0.72%
<i>1968- 1982</i>	1.77%	2.43%	1.49%	2.16%	2.45%	2.05%
<i>1979- 2006</i>	1.09%	1.54%	0.92%	0.46%	1.03%	0.28%
<i>1982- 2006</i>	1.12%	1.54%	0.97%	0.43%	0.99%	0.26%
<b><i>1900- 2006</i></b>	<b>0.90%</b>	<b>1.48%</b>	<b>0.59%</b>	<b>1.36%</b>	<b>2.05%</b>	<b>1.03%</b>
<i>2006- 2034</i>	0.92%	1.19%	0.84%	0.75%	1.07%	0.67%
<b><i>2034- 2084</i></b>	<b>0.77%</b>	<b>1.00%</b>	<b>0.70%</b>	<b>0.76%</b>	<b>1.03%</b>	<b>0.70%</b>

Based on the intermediate assumptions of the 2010 Trustees Report

# Life Expectancy at Age 0

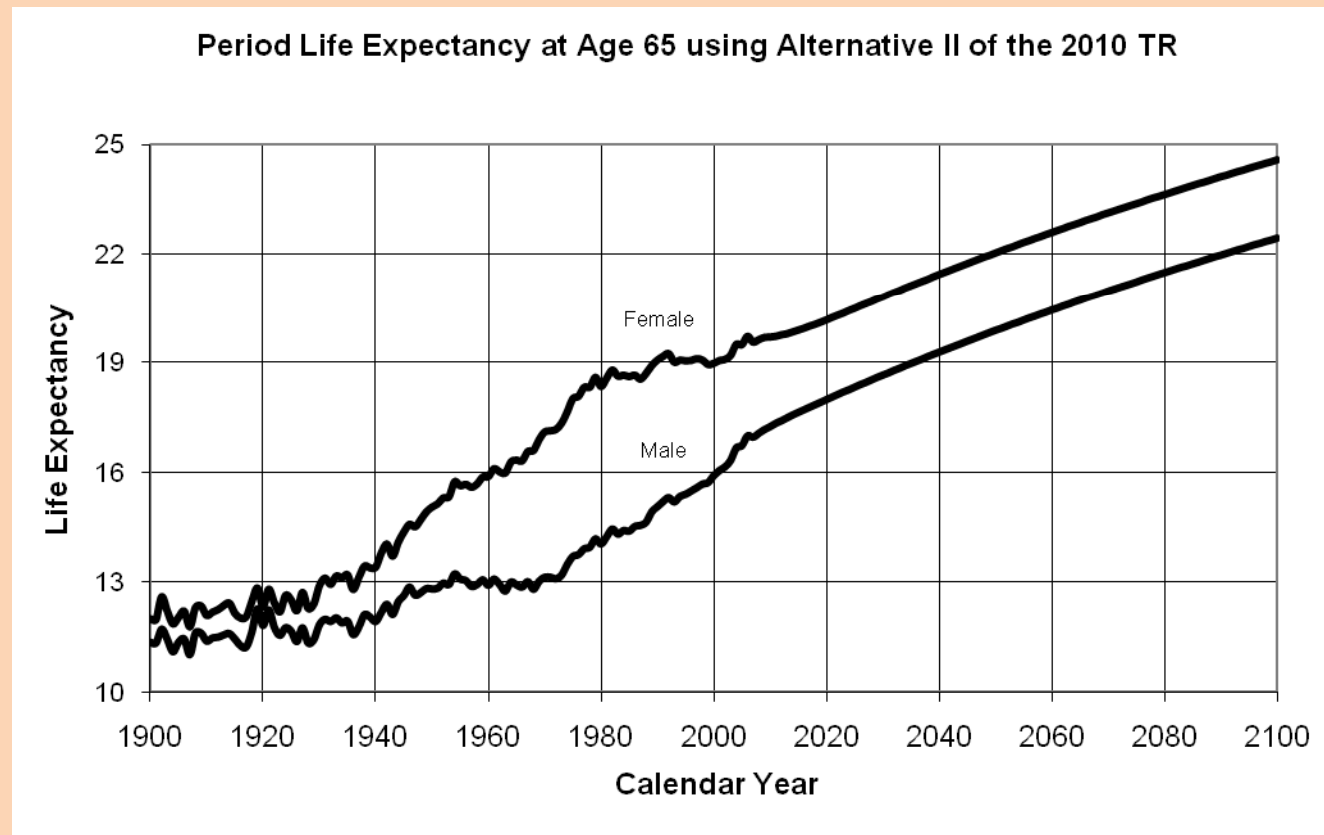
6



# Life Expectancy at Age 65



7



# Projecting Mortality by Cause of Death



8

- In the past, the reduction of mortality rates has varied greatly by cause of death. In assessing past experience and future possible improvement in mortality, we believe it is useful to understand the variations in mortality by cause of death.



# Projecting Mortality by Cause of Death



9

- The seven causes in the current mortality methodology are used as components in determining overall mortality.
- The resulting overall mortality is closely monitored for reasonableness and results in iterative change if unreasonable.

# Projecting Mortality by Cause of Death



10

## Annual Rates of Reduction in Central Death Rates for Age Group 65-84 by Sex and Cause:

<u>Ages 65 - 84</u>	<u>Male</u>	<u>Female</u>
	<u>Ultimate</u>	<u>Ultimate</u>
Heart Disease	2.2%	2.2%
Cancer	0.8	1.0
Vascular Disease	2.0	2.0
Violence	0.5	0.5
Respiratory Disease	0.3	0.3
Diabetes Mellitus	0.3	0.3
Other	0.3	0.3

# Projecting Mortality by Cause of Death



11

## Annual Rates of Reduction in Central Death Rates for Age Group 65-84 by Sex and Cause:

<u>Ages 65 - 84</u>	<u>Male</u>		<u>Female</u>	
	<u>1979-2006</u>	<u>Ultimate</u>	<u>1979-2006</u>	<u>Ultimate</u>
Heart Disease	<b>3.0%</b>	2.2%	<b>2.7%</b>	2.2%
Cancer	<b>0.5</b>	0.8	<b>-0.5</b>	1.0
Vascular Disease	<b>2.8</b>	2.0	<b>2.2</b>	2.0
Violence	<b>0.8</b>	0.5	<b>0.1</b>	0.5
Respiratory Disease	<b>0.2</b>	0.3	<b>-2.9</b>	0.3
Diabetes Mellitus	<b>-2.4</b>	0.3	<b>-1.3</b>	0.3
Other	<b>-0.6</b>	0.3	<b>-1.7</b>	0.3



# Projecting Mortality by Cause of Death

12

- Results in a deceleration of the rate of decline in overall mortality as time marches forward.
- Both the 2003 and the 2007 Technical Panels recommended dropping separate projections by cause of death
- However, the concept of deceleration was endorsed by the 2003 and 2007 Technical Panel.

# Projecting Mortality by Cause of Death

## Effect of using cause of death in mortality projections

		Males			Females		
		<u>Total</u>	<u>0-64</u>	<u>65+</u>	<u>Total</u>	<u>0-64</u>	<u>65+</u>
<b>2034-</b>	<b>2059</b>	0.82%	1.04%	0.75%	0.81%	1.07%	0.75%
<b>2059-</b>	<b>2084</b>	0.73%	0.97%	0.66%	0.71%	1.00%	0.65%
<b>2034-</b>	<b>2084</b>	<b>0.77%</b>	<b>1.00%</b>	<b>0.70%</b>	<b>0.76%</b>	<b>1.03%</b>	<b>0.70%</b>

Based on the intermediate assumptions  
of the 2010 Trustees Report